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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,873	09/30/2003	Sung-Bae Lee	SEC.1084	2344
20987	7590	05/17/2005		
VOLENTINE FRANCOS, & WHITT PLLC ONE FREEDOM SQUARE 11951 FREEDOM DRIVE SUITE 1260 RESTON, VA 20190			EXAMINER ESTRADA, MICHELLE	
			ART UNIT 2823	PAPER NUMBER

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/673,873

Applicant(s)

LEE ET AL.

Examiner

Michelle Estrada

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.  
4a) Of the above claim(s) 17-20 and 26 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-4, 21 and 24 is/are rejected.  
7) ☒ Claim(s) 5-16, 22, 23 and 25 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/28/05.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

Applicant's arguments with respect to claims 1-4, 21 and 24 have been considered but are moot in view of the new ground(s) of rejection.

### ***Information Disclosure Statement***

The information disclosure statements (IDS) submitted on 2/28/05 have been considered by the examiner.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada et al. (6,534,397) in view of Kazuhiko (JP60235428).

With respect to claim 1, Okada et al. disclose forming an insulation film (13/14/15) on a substrate (11); forming a photoresist pattern (18) on the insulation film (Col. 10, lines 35-40); performing a first etching process (Fig. 2F) comprising etching the insulation film using the photoresist pattern as a mask to form an initial trench (20) in the insulation film (Col. 10, lines 44-50); and subsequently performing a second etching process that is distinct from said first etching process, said second etching process

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comprising etching the insulation film in which the initial trench (20) has already been formed to thereby enlarge the initial trench (Col. 11, lines 39-45).

Okada et al. do not disclose that said second etching process being a wet etching process.

Kazuhiko discloses forming a hole (7) in a substrate (1) by a dry etching process, and allowing the hole to extend through the substrate by a chemical etching process (wet etching) (See abstract).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Okada et al. and Kazuhiko to enable the second etching step of Okada et al. to be performed according to the teachings of Kazuhiko because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed second etching step of Okada et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07.

With respect to claim 2, Okada et al. disclose further comprising removing the photoresist pattern after the initial trench is formed and prior to the second etching process (Col. 11, lines 3-10).

With respect to claim 3, Okada et al. disclose wherein said enlarging the initial trench comprises increasing a width of the initial trench while maintaining a depth of the initial trench (See Fig. 2H and 2I).

With respect to claim 4, Okada et al. disclose wherein said forming of the insulation film comprises forming one of an oxide and a fluoride film on the substrate (Col. 3, lines 5-6).

With respect to claim 21, Okada et al. disclose forming an insulation film (13/14/15) on a substrate (11); forming a photoresist pattern (18) on the insulation film (Col. 10, lines 35-40); performing a first etching process (Fig. 2F) comprising etching the insulation film using the photoresist pattern as a mask to form an initial trench (20) in the insulation film (Col. 10, lines 44-50); and subsequently performing a second etching process that is distinct from said first etching process, said second etching process comprising etching the insulation film in which the initial trench (20) has already been formed to thereby enlarge the initial trench (Col. 11, lines 39-45); and depositing a conductive material in the enlarged trench to form a conductive pattern (26) in the insulation film (Col. 11, line 63-Col. 12, line 21).

With respect to claim 24, Okada et al. disclose wherein said material deposited in the enlarged trench comprises copper (Col. 11, line 65).

***Allowable Subject Matter***

Claims 5-16, 22, 23 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: there is no disclosure in the prior art of the limitations recited in claims 5-16, 22, 23 and 25.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

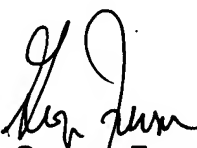
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
George Fourson  
Primary Examiner  
Art Unit 2823

  
ME  
May 16, 2005